Kicker Meeting

Tuesday, September 07, 2010
3:02 PM

Meeting: Morgan, Vander, me, Werkema, Chris Jensen

- Mu2e era A:IKIK
  - Kicker will remain in high dispersion
  - 1.6 microsec flat top
  - Rise time can be slow since starting with an empty machine
  - Fall time needs to be 2-3 53MHz bunches. Possible to use bumper magnets to cancel rining
  - 3m insertion. Possible room to expand, but have to pay attention to phase advance which changes quickly.
  - 4mrad net kick
  - 1.2 KGm
  - Model after Tevatron injection kicker
    - Can't do clambshell trick
    - Each module 1m long
  - Hard part is getting HV in and out...hard to make low inductance.
  - 30mm vertical
  - Wide horizontal aperture, but don't need to cover entire aperture
  - Chris needs to know the horizontal width of the injection orbit.
- Mu2e era A:EKIK
  - Pluck out bunches one at a time
  - Four bunches circulating in time - 397 nsec bunch to bunch
  - Bunch length 150 nsec
  - Could do
    - Rise time = 100 nsec
    - Flat top = 200 nsec
    - Fall time = 100 nsec
  - 15 Hz burst rate
  - 8 extractions in one Nova cycle. Duty cycle 8 of 20
  - 4mrad, 1.2 KGm
  - Move kicker to a low dispersion area
  - Tevatron style kicker
    - 80nsec, so its fast enough
    - 5 modules clambshelled gets you 6mrad
    - We would have 3 modules -> ~4mrad
  - Re-use the Tevatron injection kicker? Would save money and time
  - Cost
    - 3 magnets, 6 power supplies (steal tev stuff?)
    - 350 K per magnet for the power supply
    - Magnet is only about 50K
- Mu2e era Debuncher Injection kicker
  - Plucking single bunches
    - Rise and fall times = 400nsec
    - Flat top = 200 nsec
  - Use existing D:EKIK with shorter PFN???
- Abort System
  - 15Hz cleanup
    - Will need a high powered dump - can take full power for 1 hour
    - Single bunch

- Can have slow rise and fall times
- There is also the need to be able to abort the beam
  - Increase PFN length to increase the flattop length long enough to abort both the Debuncher beam and the Accumulator beam after being transferred down the A/D line.
  - Can make long PFNs by putting them in series.